

f1_Gelatin silver print of a 1922-23 photogram

63.8x92.1cm. *Photogram N. 1-The Mirror*, Dessau, c.1928, László Moholy-Nagy

(source: Katherine Ware, *In Focus: László Moholy-Nagy*;

Photographs from the J. Paul Getty Museum (Los Angeles: Getty Publications, 1995), 70.)

new visions in space-time: architecture and photography in the experimental photo-practice of Moholy-nagy

Timothy Burke

University of Newcastle, School of Architecture and the Built Environment,
timothy.burke@newcastle.edu.au

This paper will explore the relationship between photography and architecture in the work of Moholy-Nagy, through an exploration of its spatial properties. Developing a critical theory around spatial relationships that occur in the artistic production, the paper argues for Moholy-Nagy's work to be seen as a hybrid form of avant-garde experimentation that bridges the medium of both photography and architecture, and draws into question the qualities of each. By exploring this interstitial mode of experimentation, the paper argues for a unique mode of spatial production in Moholy-Nagy's work, that brings together modern concepts of space-time and the photographic gaze to reframe the spatial experience of architecture. Moholy-Nagy's formative experiments with photo-media throughout the inter-war period provides a unique insight into a critical interaction between photography architecture occurring at the Bauhaus. For Moholy-Nagy, by "arresting fragments of the world", the criticality of photography was elevated by its ability to both represent and abstract architecture to produce new spatial compositions. At the centre of this discussion is Moholy-Nagy's development of creative processes in photography that can be applied to architectural scholarship, where technologically enhanced vision is cultivated as the new embodied modern experience. paper examines his written work through the framing of Giedion and Benjamin to advance a critical theory that argues for the mutual development of spatial production in photography and architecture. The paper critically analyses the spatial composition of his experimental photo-practice, taking examples from his oeuvre of photography (View From the Berlin Radio Tower in Winter, 1928), photoplastics (Murder on the Railway Line, 1927), and photograms (Photogram No. 1-The Mirror, 1922-23). The correlations of spatial production in these different mediums provide new insights into space creation as a critical interaction between photography and architecture.

keywords Architectural theory, Photography, Avant-garde, Space, László Moholy-Nagy

from material

"In photography we possess an extraordinary instrument for reproduction. But photography is much more than that. Today it is in a fair way to bringing (optically) something entirely new into the world. The specific elements of photography can be isolated from their attendant complication, not only theoretically, but tangibly, and in the manifest reality".

Moholy-Nagy, 1933¹

In this essay, "A New Instrument of Vision", László Moholy-Nagy (1895-1946) identifies eight varieties of photographic modes: from 'abstraction', 'reportage', 'snapshots', 'prolonged exposures', 'intensified', 'penetrative', 'simultaneous' and 'distorted'. The purpose of his argument is to cultivate photography as a new technical means for seeing the world beyond the orthodox reproduction of perspectival views. He goes on to argue that, "through photography, too, we can participate in new experiences of space [...] we have attained an enlargement and sublimation of our appreciation of space, the comprehension of a new spatial culture"². This critical interaction of space through an exploration of photography can be traced through many of his theories and, as this paper argues, is central to his contribution to the development of a new visual culture.

As a leading figure to the development of modern visual discourse, the work of the Hungarian artist and technocrat Moholy-Nagy is a critical figure for investigation considering his ties to the historic avant-garde groups: from the Hungarian activist group *MA*, the Dutch *de Stijl*, the Berlin Dadaists, and the Russian Constructivists. Moholy-Nagy's appointment at the Weimar Bauhaus by Walter Gropius in 1923 –which he continued to teach at in Dessau until 1928, and later in America becoming the director of the New Bauhaus in Chicago from 1937-1928– locates his experimental work at the centre of modern artistic development.

The interaction of photography and architecture can be traced as a focal point in Moholy-Nagy's work through their mutual engagement. The site of this engagement occurs in much of his theorising about space, which emerges broadly across his art practice, but is especially potent in his experimental photo-practice. The significance of the transaction between photography and architecture is their shared qualities of spatial production and Moholy-Nagy's dissemination of architecture articulated in spatial terms. The primacy of space not only structures a modern corporeal experience of the world, it is, of course, the production of a spatial experience.

production reproduction

It is this notion of productive means which is a significant development of the historic avant-garde. Moholy-Nagy recognised that in order to create new spatial compositions through photography, the photographic image must first negate orthodox modes of reproduction (that is, simply to copy). In the essay "Produktion-Reproduktion" (*De Stijl* 7, 1922: republished in his manifesto "*Malerei, Fotografie, Film*", 1925)³ Moholy-Nagy posits this dialectic of production and reproduction, whereby in deference to reproduction, he advocates photography as a new "mechanical means of representation" to be instrumentalised for the "productive" development of optical, spatial and functional art forms⁴. Moholy-Nagy sites this critical departure as a development of technology, writing "it is only in recent years that the course of development has allowed us to see beyond the specific instance and recognise the creative consequences"⁵. Here, the technical apparatus of photography is able to expand human visions into new territories of spatial experience radically to "produce new, previously unknown relationships" and allowing one to "see the world with entirely different eyes"⁶. This is what he describes as *Die neue Optik: the new vision*.

new visions in space-time: architecture and photography in the experimental photo-practice of moholy-nagy

This dialectic can also be found in Walter Benjamin's, "The Author as Producer" (1934), where the difference between photographically reproducing the world through objective, documentary means, and producing new worlds, is the difference between "transmitting the apparatus of production and transforming it"⁷. Likewise, Moholy-Nagy's radical transformation of the photographic apparatus is just as Benjamin describes Brecht's refunctioning (*Umfunktionierung*)⁸ of his Epic Theatre in response to technology, where this *refunctioning* "describe[s] the transformation of forms and instruments of production"⁹. With Moholy-Nagy as the major proponent of the thrust of *new optics*, it is in the renewed critical appraisal of his *new vision* that we encounter an interaction between photography and architecture that is rarely discussed, and at the centre is the dialectics of production/reproduction.

ausschnitte (fragments)

One such mode of production is made available by photography which allowed Moholy-Nagy to develop a method of abstracting "fragments of the world" (*Ausschnitte*), where fragmented images of architecture and space become both the element and the outcome of spatial production. Moholy-Nagy suggests that photography, unlike other art forms, is unique in this regard "no manual means of representation (pencil, brush, etc.) is capable of arresting fragments of the world seen like this"¹⁰.

This notion is instrumental in Moholy-Nagy's most influential book, *Von Material zur Architektur* (1928), republished in 1930 in English as *the New Vision*, which, as textbook for the Bauhaus, established a visual language using photography that isolated the elements of creative production into 'texture', 'surface', 'massing', 'ornament', 'volume', 'light', and 'space (architecture)'. This is what Reyner Banham, in "Theory and Design in the First Machine Age" (1960) describes as "'lexikalisch' in its treatment of materials and methods, it is encyclopaedic in its coverage of the Modern Movement"¹¹. While on the one hand this could be considered a modern apparition of semantic deconstruction, on the other hand, Hal Foster, in "The Bauhaus Idea in America" (2006), describes this as a productive form of Elementarism. Here critical encounters with phenomena (or fragments: in this case material and spatial elements) are made available as ingredients for experimentation using a process Foster identifies as "analysis-abstraction-extension". Critically connecting Moholy-Nagy to the historic avant-garde and Brecht's "refunctioning", Foster writes,

*"typically, Moholy would penetrate the facture of a given material or medium, extract the key properties of its structure, reconcile them as general principles, and then push them as far as they might go. The operation could be literally radical: to cut under and so displace conventional categories of the object, to redefine and so refecton its common uses, and to extend these renewed capacities to other fields"*¹².

Curiously, a similar strategy is discussed by Moholy-Nagy when he describes the fundamental strategy of Cubism as "the resolution of the external world into its elements"¹³. However, instead of resolution, these elements offer an opening-up for Moholy-Nagy. Moreover, the *Ausschnitte*, like the Dadaist readymades or Surrealist collages, can be used in service of new productive ends, and, by extension, architectural ends. A sentiment made clear by Benjamin in "The Author as Producer", writing that photography "[...]can no longer depict a tenement block or a refuse heap without transfiguring it"¹⁴. Here, the transmutation of fragments taken by the camera become the material of production.

obliquity

Likewise, the theories of Cubism is instrumental to Moholy-Nagy's interest and space, no doubt because of its revival of the primacy of space as a central concern to

the historic avant-garde. Moholy-Nagy, through mutual engagements with Paul Klee at the Bauhaus, and more distantly with Duchamp and Picasso, was fully exposed to new experimental modes of spatial production in art. It is through examples of the work of Picasso in "A New Vision" that Moholy-Nagy examines what he identifies as the third phase of Cubism, the flattened image, as spatial representation and an expression of the "the distorted object" in terms of "spatial articulation –back, forward, oblique– of the pictorial space of the picture plane"¹⁵. This leads quickly into a discussion about creating a new space through modes such as the photogram (where the picture plane and pictorial space fully converge), the new possibilities of photography expand Cubist techniques such as superimposition of images in time (multiple exposures), and depicting objects in orthographic, rather than Euclidean views.

These new points of view are central to Moholy-Nagy's *new vision*: a direct relationship of Cubism to photography is made clear when he defends this new potential, arguing, "nor should we regard the ability for the lens to distort –the view from below, from above, the oblique view– as in any sense merely negative"¹⁶. In recognising the significance of this interaction, Giedion, in "Space, Time and Architecture" (1941), notes the significance of Cubism –as an orthographic return to the plane, as a new spatial representation, not reproducing from a single vantage point, but a dissection of an object in motion from multiple vantage points in space-time– provoking Moholy-Nagy to rationalise it, although, as he writes, "[Cubism's] symbols were not rational, were not to be utilised directly in architecture and the applied arts, but they did give force and direction to artistic imagination in other fields"¹⁷. Interested in combining all fields into the ideal *gesamtkunstwerk*, Cubism especially provided a point of departure for Moholy-Nagy's *new vision* by radicalising space into oblique representations.

new visions in space

"Space (architecture)" is the concluding chapter of *The New Vision*, and it is here that space as an expanded field of architecture provides an opportunity to question qualities of spatial production in both fields of photography and architecture. Moholy-Nagy constructs an argument around architecture in spatial terms, challenging orthodoxies of formal or tectonic conceptions of architecture, and instead suggests that "the real architectonic conception, beyond the fusion of all purposeful functions, is usually not discussed, namely, space creation"¹⁸. For Moholy-Nagy, the veracity of space was such a force in architecture, that in order to navigate its complex meaning and histories he provides forty-four different associations of space: e.g. "mathematical", "architectural", "pictorial", "abstract", "finite", "limitless", "movement", etc¹⁹.

Moholy-Nagy's definition sees the experience of architecture as the corporeal experience of space, describing architecture as "the actual felt quality of spatial creation, the equilibrium of taut forces held in balance, the fluctuating interpretation of space energies [...] the often invisible play of forces present in the materials and their relationship in space"²⁰. The influence of this definition in the development of architecture at the Bauhaus should not be underestimated. Reyner Banham, in *Theory and Design in the First Machine Age* (1960), asserts that *The New Vision* is the most influential book in the formation of modern optics. What "Moholy sets out is something that Le Corbusier might have termed a *formation de l'optique moderne*. It is almost exclusively concerned with visual and formal problems, and deals with them in a resolutely Modern manner"²¹.

These spatial observations are not limited to architectural considerations. This definition can be seen in play in much of Moholy-Nagy's creative art practice. His continued experiments in fathoming the primacy of space as a structuring principle is evident in all his art forms: painting, photography, film sculpture and architecture. This is no surprise with the *gesamtkunstwerk*, operating as the dominant paradigm at the Bauhaus.

new visions in space-time

The production of architecture through new engagements with technology are embedded within the Bauhaus paradigm, set apart from historical forms of art and architecture. One such advancement is clear in Sigfried Giedion's, *Bauen in Frankreich, Bauen in Eisen, Bauen in Eisenbeton* (1928, in English *Building in France, Building in Iron, Building in Ferrocconcrete*, 1995²²). Giedion, a close friend of Moholy-Nagy, engaged him to work on the typography, layout and cover of the publication. On the cover of the first edition there is a negative photograph the *Pont Transborduer* in Marseilles taken from the Moholian-style fish-eye angle, a technique Giedion picked up from Moholy-Nagy directly when he first discovered it on a holiday that they and their wives, Carola and Lucia, had together²³.

Through the dissemination of its image, Pont Transborduer became an icon of modernity, attracting attention of the avant-garde, including Herbert Bayer, Man Ray, Walter Benjamin and Moholy-Nagy himself²⁴. A year after *Bauen in Frankreich* was published, Moholy-Nagy visited the bridge to take a series of photographs and experience the structure first-hand. A comparison of one of Moholy-Nagy's photographs, 'Pont Transborduer, Marseilles' (1929, (f1)), with Giedion's cover reveals not only the similarity of their technique, but how they are able to articulate new material and spatial relationships. Both are printed as negatives which reverses the spatial dynamic, the space is rendered black as an object which is carved by the tectonics of the structure. Motion is implicit to both, the mechanical operation of the crane, frozen in time, and the movement of bodies down the spiral stairs.

It is from the photographs Pont Transborduer in *Bauen in Frankreich* that Walter Benjamin observes, "for in those days who besides the engineer and the proletarian had climbed the steps that alone made it possible to recognise what was new and decisive about these structures: the feeling of space?"²⁵ Here, Moholy-Nagy's definition of architecture as spatial experience can be transcribed from the photographic image of architecture. Detlef Mertins recognises Benjamin's affinity with Moholy-Nagy's *new vision*, whereby this new perspective offers "profane illuminations" with such force as to enter the unconscious image of modern architecture²⁶. Likewise, Mertins suggest Giedion's understanding of 'dematerialisation', 'spatial extension', and 'movement' can be drawn directly these qualities recognisable in Moholy-Nagy's architectural photography.

It is clear that Giedion and Moholy-Nagy developed a shared interest in space-time, with Giedion's *Space, Time and Architecture* (1941) having been published two years earlier than Moholy-Nagy's "Space-Time and the Photographer" (1943). It was central to their view of the technologically mediated modern experience of architecture, where movement and space evoke space-time relationships. Evoking the sentiments of the Futurists, Moholy-Nagy writes, "architecture appears no longer as a static structure [...] architecture must be linked with movement. This changes its entire aspect so that a new formal and structural congruence with the new element, *time*, becomes manifest"²⁷.

to architecture

If we take Moholy-Nagy's definition of architecture as a relationship of space-time experiences, we may begin to dismantle his images across his various photo media simply with in regard to analytical variations of space. A spatial-analytical approach may heighten an understanding of the development of modern aesthetics. Here, we may fathom architecture through the photographic gaze and give rise to three major interactions between photography and architecture through Moholy-Nagy's photo-practice as an embodied form of avant-garde experimental production.

bird's-eye photography

The first, most obvious, interaction between photography and architecture occurs through the ability to experience the city from new views. Here, "new relationships" are afforded by the technologically enhanced means of optics by photographing the city in plan: removing perspectival depictions of reality and moving into oblique vision. For Moholy-Nagy this allows previously unrecognised relationships between people and places. As he writes, "new views appear below an airplane, and also from looking upwards at an airplane. The essential is the bird's-eye view, which is a more complete space experience. It alters the previous conception of architectural relations"²⁸. Giedion recounts when Moholy-Nagy first began to photograph like this: "I remember Moholy taking a photograph of the terrace from a window high above it which annulled the perspective as it forced objects and proportions into the two-dimensional plane. [...] it was a completely new beginning. The camera has never been used like that before"²⁹.

Moholy-Nagy had developed an interest in bird's-eye photography, collecting them whenever he encountered one. For example, in "Painting, Photography Film", he presents a photograph taken through the dome of St. Paul's Cathedral, London looking down in a plan at the floor below. Radiating checkered patterns in the tiles with circles arranged concentrically in the floor are overlaid are rows of pews arranged rectilinearly. The keyhole of the oculus in the dome sets two fields of view on the picture plane: the ceiling and the floor, as if looking through a pinhole.



f2_Gelatin silver print

25.3x19cm *View From the Berlin Radio Tower in Winter*, Berlin, 1928, László Moholy-Nagy
(source: Krisztina Passuth, *Moholy-Nagy* (London: Thames and Hudson, 1985), ill.79.)

In comparison to the rigid formal structure of this image, in one of Moholy-Nagy's birds-eye photographs taken from the Berlin radio tower tower – which he would often return to to take photographs from – *View From the Berlin Radio Tower in Winter* (1928, **(f2)**), an entirely different spatial experience is offered. Unlike the photograph of St. Paul's, this photograph is composed dynamically: springing radial and tangential vectors from circular element offset to the bottom right of the image. The photograph is a taken in winter where the white snow offers stark contrasts the black path and building. Much like the way the oculus acts as a frame in St. Paul's, the building with its internal right-angled corner borders

new visions in space-time: architecture and photography in the experimental photo-practice of moholy-nagy

the space of the ground. However, the margin of contract between white, to grey, to white, to black, to white flattens the volume of the building: it could easily be foregrounded or backgrounded in the image.

Even in what may seem to be a relatively traditional depictions of space (where a photograph simply records whats in frame) this composition presents carefully crafted spaces and vector relationships. *From the Radio Tower Berlin*, is not reproduction. It is a production of carefully resolved space. This is made obvious in a comparison with a painting he had published three years earlier in "*Malerei, Fotografie, Film*", 'Construction "K"' (1925). This painting, like much of Moholy-Nagy's Constructivist works, depicts overlapping planes of geometry arranged in space. His motif of the diagonal line (employed to create a "spatial network", "diagram of tensions", and as "symbols of motion"³⁰) and the circle appear here in much the same way as they can be seen in *From the Radio Tower Berlin*. A relationship between these two forms, sets up a relationship in space, disrupted or heightened by the placement of smaller geometries: the thin line, the cross. What is significant is a translation of the criticality of form (developed from compositional experiments in painting) to a the reframing existing space, and the way this understanding structures both the depiction of architecture and the photograph.

photoplastics

As an interstitial mode of photography and painting –the photo-montage, or what Moholy-Nagy calls photoplastics– a more controlled articulation of architecture emerges through the refashioning of its spatial narratives using collage. This is the second interaction between photography and architecture which draws together Moholy-Nagy's definition of architecture as "spatial relationships" and instrumentalising photography in terms of *Ausschnitte* allows an expanded field of spatial production.



f3. Gelatin silver print (photomontage)

28.1x20.8cm. *Love Your Neighbour (Murder on the Railway Line)*, Dessau, 1927, László Moholy-Nagy
(source: Louis Kaplan, *Laszlo Moholy-Nagy: Biographical Writings*
(Durham & London: Duke University Press, 1995), 135.)

In *Love Your Neighbour (Murder on the Railway Line)* (1927, **f3**), photographs of a railway station taken from different views are fragmented and offset into a new composition. The composition is structured by two overlapping circles of the same size, offset by one-sixth of their proportion on forty-five degree diagonal. The one-point perspectives of the rail line are unresolved, providing five simultaneous vanishing points. From the largest fragment on the left, the vanishing point is extended for the two figures in space, however the scale is distorted, flattening the image. The multiple views are Cubist in their depiction of space³¹. It is, however, the engagement of architecture of critical interest here, where these multiple vanishing points can be arranged from fragments of architecture's image in order to create new spatial relationships and a new experience of architecture.



f4. Gelatin silver print of a protoplactic

17.4x12.5cm. *How Do I Keep Young and Beautiful*, Berlin, 1920, László Moholy-Nagy
(source: Achim Borchardt-Hume, *Albers and Moholy-Nagy: From the Bauhaus to the New World*
(Tate Publishing: London, 2006), 38.)

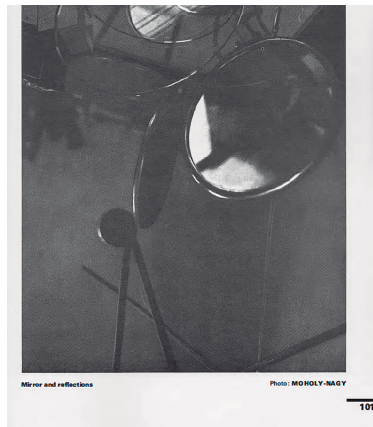
This ability to construct spatial relationships emerges in an more elemental iteration in, *How do I Keep Young and Beautiful* (1920, **f4**). Here, just three elements construct a spatial dialectic, the primary articulation of space is given by a single circle with a bold outline. The relation between the spaces sets up a dualism of dynamic and static / interior and exterior space: the girl inside on the bottom right quarter of the circle, on the opposite (through a 45 degree angle) a figure falling backward. Here, the abstraction of these fragments take the photographic image and dematerialise it, establishing a mode of photography that can produce new spatial explorations.

new visions in space-time: architecture and photography in the experimental photo-practice of moholy-nagy

photograms

The third and final interaction between photography and architecture occurs in Moholy-Nagy's photograms when viewed as explorations in space-time. Moholy-Nagy, along with Christian Schad and Man Ray developed the photogram (an experimental method of camera-less photography) from earlier function uses outside of art practice. Photograms are the rendering of forms with light through the controlled timing of single or multiple exposures. Light can be excluded, reflected or refracted as it interacts with objects placed on the picture plane. For Moholy-Nagy, as he discusses in "Abstract of an Artist" (1944), light materialises as a new creative process of "painting with light, not on the surface of canvas, but directly in space"³². Of critical interest here however, is how for Moholy-Nagy, light is a medium for creating transparent plane, where the transparencies act as "the new medium for spatial relationships". These transparencies are a photographic record that describe the relationship of acts in space and time, compressing them into a two dimensional representation of space-time

A Benjaminian reading of the optical unconscious can be drawn. According to Merins, Benjamin's optical unconscious is a spatial construction afforded by the new vision of photography. As Mertins writes, "the close-up - the blow-up, the enlargement, the cropped image, the fragment. 'With the close-up', he observed, 'space expands'³³. Here, Moholy-Nagy's *Ausschnitte* reoccurs in its most abstract form: it is the distorting of space in its purest and most corporal method.



f5_A Mobile array of mirrors

Mirror and Reflections, Weimar, c.1925, László Moholy-Nagy

(source: Moholy-Nagy, *Painting Photography Film*, 101)

A comparison of Moholy-Nagy's 'Mirror and Reflections', printed in *Painting Photography Film*³⁴ and 'Photogram No. 1-The Mirror' (c.1928, (f5)), a print from a 1922-23 photogram, reveals how this spatial expansion occurs. The photograph 'Mirror and Reflections' is of a mobile of circular mirrors taken from a fish-eye angle. It depicts an almost isometric view: one mirror in the top right third of the image almost faces the camera, while

other mirrors are either angled away or cropped by the frame of the image. While *Mirror and Reflections*' still conforms to Euclidean space, *'Photogram No. 1-The Mirror'* restructures it. It depicts an image that could have been formed by the other: a circular mirror, this time in true orthographic view. The mirror is located again, in the top right third of the image. Diagonal transparencies are placed similarly to the mirrors of the mobile, angled away from view. It is a flattening of space: from objects in space (the mirror and the room), to pure geometry rendered by tonal variations of light.

The Photogram is the ultimate production of space, where reproduction is almost entirely removed as the final stage of photographic abstraction. Moholy-Nagy makes this tension of production and reproduction explicit:

"Photograms, however, bring a completely new form of space articulation. It no longer has anything to do with the record of an existing space (or space-time) structure. This is usually created in the form of architecture from elements clearly circumscribed by their masses, lengths, widths and heights. [...] The photogram for the first time produces space without existing space structure"⁶⁵.

It is here, at the interaction of photography and architecture (or in this case, the negation of architecture) that space can be explored in an entirely new way. This understanding is pivotal to the advancement of the *gesamtkunstwerk* –not only for Moholy-Nagy's *new vision*, but for the historic avant-garde– where the dematerialisation of the image of architecture as an exploration of space is taken to its elemental form, to be refunctioned into the production of new space relationships.



f6_Gelatin silver print of a 1922-23 photogram

63.8x92.1cm. *Photogram No. 1-The Mirror*, Dessau, c.1928, László Moholy-Nagy
(source: Katherine Ware, *In Focus*, 70.)

conclusion

Given the ongoing connections made available between Moholy-Nagy and the historic avant-garde through a continued scholarship of modernity, the nature of his experimental photo-practice allows new insights into the development of both the architectural and photographic traditions. The unique relationship of spatial production in the early avant-garde offered in this paper of Moholy-Nagy's work, depicts the interaction

new visions in space-time: architecture and photography in the experimental photo-practice of moholy-nagy

of photography and architecture as a hybrid-mode experimental space creation. Occupying a territory that engenders critical interactions between various progressive art theories – constructivism, Cubism, Elementarism, Dadaism and Surrealism – when applied to fathoming of architecture through the photographic gaze, Moholy-Nagy's *new vision* embodies much of the historic avant-garde, and is a seminal advancement of the modern visual discourse. Where aspects of his work demonstrate spatial production with photography and architecture overlap, Moholy-Nagy's experimental photo-practice offers an expanded field and a new creative processes through this interstitial mode of spatial production.

There is an uncanniness to his work, which is heightened when you compare this photography to his photograms, and his photomontages. The correlations are profound, driven by a strong agenda to aestheticise the social and cultural potential of the machine age. It calls into question, in the production of the architectural image, not only the way architecture can be reproduced as a photographic image, but the way the qualities of architecture can be produced. By this virtue the work invites new readings in architecture and photography as a shared site of spatial experience in space and time.

Given this research, these interstitial entanglements may appear more obvious, and have implications not just on photography and architecture, but within other creative disciplines, such as film and exhibition planning both in a broader look Moholy-Nagy's work and other works of the historic avant-garde³⁶. Ongoing connections to photography and architecture can begin to occur. What Moholy-Nagy's theories and experimental photo-practice in particular provides, is a potential frame for viewing the relationship of not just reproduction, but new forms of production. By problematising space production, Moholy-Nagy has left an indelible legacy on both architecture and photography, and the hybrid space they share.

endnotes

1. László Moholy-Nagy, "A New Instrument of Vision", in *Moholy-Nagy*, ed. Krisztina Passuth (London: Thames and Hudson, 1985), 326. Originally published as "A photographia: napjaink objektív látási formája", *Korunk* 12 (1933): 911-13.
2. Ibidem, 328.
3. See: László Moholy-Nagy, "Malerei, Fotografie, Film", *Neue Bauhausbücher* 8 (1925). Reprinted in *Neue Bauhausbücher* (Mainz: Florian Kupferberg Verlag, 1967). First published in English as *Painting Photography Film*, trans. Janet Seligman (London: Lund Humphries, 1969).
4. Ibidem, 14.
5. Idem, 7.
6. Idem, 29-30.
7. Walter Benjamin, "The Author as Producer", in *Reflections: Essays, Aphorisms, Autobiographical Writings*, ed. Peter Demetz (New York: Schocken Books, 1978), 88-90.
8. Brecht invented the neologism 'Refunktionierung' (German: *Umfunktionierung*) during the development of *Epic Theatre*, to describe the 'functional transformation' of both political and aesthetic modes. For a description of this techniques that position it within the avant-garde strategy of negation see Roswitha Mueller, "Learning for a New Society: The Lehrstück", in *The Cambridge Companion to Brecht*, eds. Peter Thomson, and Glendyr Sacks (Cambridge, MA: Cambridge University Press, 1994), 79-96; and Benjamin Noys, 'The Organization of Destruction,' *Nihilism, Destruction, Negativity: Walter Benjamin and the 'Organization of Pessimism'*. Workshop, Jan Van Eyck Academie (2012).
9. Walter Benjamin, "The Author as Producer", in *Understanding Brecht*, trans. Anna Rostock (London: Verso, 1983), 93. Originally Published in German as *Versuche über Brecht* (Berlin: Suhramp Verlag, 1966).
10. Moholy-Nagy, *Painting Photography Film*, 7.
11. Reyner Banham, *Theory and Design in the First Machine Age* (London: The Architectural Press, 1960), 314.

12. Hal Foster, "The Bauhaus Idea in America" in *Albers and Moholy-Nagy: From the Bauhaus to the New World*, ed. Achim Borchardt-Hume (Tate Publishing: London, 2006), 93.
13. László Moholy-Nagy, *The New Vision and Abstract of an Artist*, (New York: George Wittenborn, Inc, 1974), 33.
14. Benjamin, "The Author as Producer", 230.
15. Moholy-Nagy, *The New Vision and Abstract of an Artist*, 33.
16. Moholy-Nagy, *Painting Photography Film*, 7.
17. Sigfried Giedion, *Space, Time and Architecture: the Growth of a New Tradition*, Fifth Edition (Cambridge, MA: Harvard University Press, 1970), 439.
18. László Moholy-Nagy, *The New Vision and Abstract of an Artist*, 59. Moholy-Nagy goes on to argue that "space creation in not primarily a question of building material" and that "space does not have to do with a "sculptural" exterior, but instead with relations". Moholy-Nagy, *The New Vision and Abstract of an Artist*, 62-63. Emphasis in original.
19. Moholy-Nagy repeats them again in his speech at the R.I.B.A. in December 1936, published in *The Journal of the Royal Institute of British Architects*, London 44, no. 5 (January 1937). See: Moholy-Nagy, "Modern Art an Architecture", in Moholy-Nagy, ed. Krisztina Passuth (London: Thames and Hudson, 1985), 339-42. He also republished them in his article "The New Bauhaus and Space Relationships", *America and Architecture* CLI (December, 1937). See: "the New Bauhaus and Space Relationships", in Moholy-Nagy: *Documentary Monographs in Modern Art*, ed. Richard Kostelanetz (London: Allen Lane The Penguin Press, 1971), 104-13.
20. Moholy-Nagy, *The New Vision and Abstract of an Artist*, 59-62.
21. Banham, *Theory and Design in the First Machine Age*, 312.
22. Sigfried Giedion, *Bauen in Frankreich, Bauen in Eisen, Bauen in Eisenbeton*, (Leipzig: Klinkhardt & Biermann, 1928). Translated to English as *Building in France, Building in Iron, Building in Ferroconcrete*, trans. Duncan Berry (Los Angeles: The Getty Centre for the History of Art, 1995). Henceforth will be referred to as *Bauen in Frankreich*.
23. Olivier Lugon, "The Old Bridge, the Historian, and the New Photographer", in *Moholy-Nagy: Future Present*, tans. and eds. Matthew S. Witkovsky, and Carol S. Eliel (Illinois: The Art Institute of Chicago, 2016), 110.
24. Ibidem, 109.
25. Walter Benjamin, "Arcades Project", trans. Howard Eiland and Kevin McLaughlin (Cambridge, MA: Harvard University Press, 1999), 156 (F3,5).
26. Detlef Mertins, "Walter Benjamin's Tectonic Unconscious", in *Modernity Unbound* (London, AA Publications), 2011. Originally published as, "Walter Benjamin's Tectonic Unconscious" in *ANY: Architecture New York* 14, "Tectonics Unbound" (1996): 28-35.
27. László Moholy-Nagy, "Space-Time and the Photographer", in *Moholy-Nagy*, ed. Krisztina Passuth (London: Thames and Hudson, 1985), 359. Emphasis in original. Originally published in as "Space-Time and the Photographer" in *American Annual of Photography* LVII no.152 (1943). Moholy-Nagy concludes the *The New Vision* with a prose, which can be taken as either a description of architecture, or any spatial creation. It is his new vision in space-time, rendered dynamically through notions of movement, material and space. He writes, "Openings and boundaries, perforations and moving surfaces, carry the periphery to the centre, and push the centre outward. A constant fluctuation, sideways and upward, radiating, all-sided, announces that [humanity] has taken possession, so far as [our] human capacities and conceptions allow, of imponderable, invisible, and yet omnipresent space". See: Moholy-Nagy, *The New Vision and Abstract of an Artist*, 64. Removed gendered language. Similarly, so too does Benjamin write, "there is only one great, indivisible space in which relationships and interweaving rule instead of fixed borders". See: Walter Benjamin, *Arcades Project*, 156 (F3,5).
28. Moholy-Nagy, *The New Vision and Abstract of an Artist*, 63.
29. Lugon, "the Old Bridge, the Historian, and the new photographer", 110.
30. Moholy-Nagy, *The New Vision and Abstract of an Artist*, 84.
31. For example, Scolari, in *Oblique Drawing: A History of Anti Perspective* (2015) as part of the *Writing Architecture* series, discusses how the multiple perspectives occurring in the Bauhaus painting of Paul Klee are a critical negation of Renaissance perspectival laws: that is, rules to be broken. Here the mutual engagement between Klee and Moholy-Nagy is witnessed through Moholy-Nagy's exploration of this technique in medium of photography. See: Massimo Scolari, *Oblique Drawing: A History of Anti-Perspective* (Cambridge, MA: The MIT Press, 2012), 24-27.
32. Moholy-Nagy, *The New Vision and Abstract of an Artist*, 73.
33. Mertins, "Walter Benjamin's Unconscious", 26. Mertins cites Benjamin from *Walter Benjamin, Selected Writings*, eds. Howard Eiland and Michael W Jennings (Cambridge, MA: Harvard University Press), 256.
34. See ILL.52: Moholy-Nagy, *Painting Photography Film*, 101.

new visions in space-time: architecture and photography in the experimental photo-practice of moholy-nagy

35. Moholy-Nagy, "Space-Time and the Photographer", 350.

36. See, for example: Noam M. Elcott 'Rooms of our Time: László Moholy-Nagy and the Stillbirth of Multi-media Museums' in *ScreenSpace*, ed. Tamara Trodd (Manchester University Press, 2011), 25-52.

bibliography

_Banham, Reyner. *Theory and Design in the First Machine Age*. London: The Architectural Press, 1960.

_Benjamin, Walter. *Reflections: Essays, Aphorisms, Autobiographical Writings*, edited by Peter Demetz, translated by Edmund Jephcott. New York: Schocken Books, 1978.

_Benjamin, Walter. *The Arcades Project*, translated by Howard Eiland and Kevin McLaughlin. Cambridge, MA: Harvard University Press, 1999.

_Borchardt-Hume, Achim. *Albers and Moholy-Nagy: From the Bauhaus to the New World*. Tate Publishing: London, 2006.

_Foster, Hal. "The Bauhaus Idea in America". In *Albers and Moholy-Nagy: From the Bauhaus to the New World*, edited by Achim Borchardt-Hume, 92-102. Tate Publishing: London, 2006.

_Giedion, Sigfried. *Space, Time and Architecture: the Growth of a New Tradition*, Fifth Edition. Cambridge, MA: Harvard University Press, 1970.

_Giedion, Sigfried. *Building in France, Building in Iron, Building in Ferroconcrete*, translated by Duncan Berry. Los Angeles: The Getty Centre for the History of Art, 1995.

_Kaplan, Louis. *Laszlo Moholy-Nagy: Biographical Writings*. Durham & London: Duke University Press, 1995.

_Lugon, Olivier. "The Old Bridge, the Historian, and the New Photographer". In *Moholy-Nagy: Future Present*, translated and edited by Matthew S. Witkovsky and Carol S. Eliel, 105-117. Illinois: The Art Institute of Chicago, 2016.

_Mertins, Detlef. *Modernity Unbound*. London, AA Publications, 2011.

_Moholy-Nagy, László. *Painting Photography Film*, translated by Janet Seligman. Cambridge MA: The MIT Press, 1973.

_Moholy-Nagy, László. *The New Vision and Abstract of an Artist*. New York: George Wittenborn, Inc, 1974.

_Moholy-Nagy, László. "A New Instrument of Vision". In *Moholy-Nagy*, edited by Krisztina Passuth, 326-28. London: Thames and Hudson, 1985.

_Moholy-Nagy, László. "Space-Time and the Photographer", In *Moholy-Nagy*, edited by Krisztina Passuth, 348-352 London: Thames and Hudson, 1985.

_Scolari, Massimo. *Oblique Drawing: A History of Anti-Perspective*. Cambridge, MA: The MIT Press, 2012.

_Ware, Katherine. *In Focus: László Moholy-Nagy: Photographs from the J.Paul Getty Museum*. Los Angeles: Getty Publications, 1995.

CV

Timothy Burke. Is a PhD candidate and casual academic at the School of Architecture and the Built Environment, University of Newcastle, Australia. His research investigates the polemics of the machine in speculative architecture through critical theories of the avant-garde and the heuristics of project-led experimentation. In 2015 he received the Australian Institute of Architects history and theory prize for his thesis on industrial architecture, photography, and ethnography.